

## CLAIMS

We claim:

1                   1.       A scanning method for operating a scanning apparatus for optical density  
2 measurement and/or color or spectral measurement of at least one measurement object  
3 arranged on a printing medium, comprising  
4                               detecting a position of a reference object on the printing medium; and  
5                               scanning the measurement object with a sensor means based on a  
6 relative position of the measurement object with respect to the detected position of the  
7 reference object.

1                   2.       The scanning method according to claim 1, wherein the sensor means is  
2 moved in a translational movement thereof to scan said measurement object, sensor means  
3 movement being activated responsive to a detection of the reference object.

1                   3.       The scanning method according to claim 2, wherein the printing medium  
2 is carried on a roll, at an instant of detection of the reference object, a corresponding angle  $\varphi$   
3 of rotation of said roll being measured and stored.

1                   4.       The scanning method according to claim 3, wherein an angle-of-rotation  
2 increment is calculated based on a diameter of said roll, the measured angle  $\varphi$  of rotation and a  
3 predetermined distance running in a printing medium transport direction between the reference

4 object and the measurement object, the measurement object being scanned when said roll has  
5 rotated said angle increment.

1           5.     The scanning method according to claim 1, wherein scanning which is  
2 activated with a time delay relative to an instant of detection of the reference object is triggered  
3 in accordance with a currently determined printing medium speed and a predetermined distance  
4 running in a printing medium transport direction between the reference object and the  
5 measurement object.

1           6.     A scanning apparatus for optical density measurement and/or color or  
2 spectral measurement of a measurement object arranged on a printing medium, comprising:  
3                 sensor means, said sensor means including a plurality of measurement  
4 heads, said printing medium having a detection object arranged thereon at a predetermined  
5 distance running in a printing medium transport direction from said measurement object, at  
6 least one of said measurement heads being operative to detect said reference object, remainder  
7 ones of said measurement heads being activatable to detect and scan said measurement object,  
8 said remainder ones of measurement heads being activated responsive to said reference object  
9 detection.

10

1                   7.       The scanning apparatus according to claim 6, wherein said measurement  
2   object is a longitudinal measurement strip disposed along a coordinate direction approximately  
3   transversely of the printing medium transport direction.

1                   8.       The scanning apparatus according to claim 7, wherein the measurement  
2   strip includes a linearly arranged chain of measurement fields thereon, said measurement fields  
3   having specific color density values.

1                   9.       The scanning apparatus according to claim 8, wherein for detection and  
2   scanning purpose, each measurement head is associated with at least one measurement section,  
3   which measurement section includes measurement fields.

1                   10.      The scanning apparatus according to claim 9, wherein each measurement  
2   section comprises two adjacent spaced apart measurement zones intervened by a narrow track.

1                   11.      The scanning apparatus according to claim 10, wherein the measurement  
2   zones each have identically recurring sequences of color density values.

1                   12.      The scanning apparatus according to claim 10, wherein each  
2   measurement zone has measurements fields of a same longitudinal dimension.

1                   13.     The scanning apparatus according to claim 11, wherein each  
2     measurement zone has measurement fields of a same longitudinal dimension.

1                   14.     The scanning apparatus according to claim 13, wherein each  
2     measurement zone includes a common number of measurement fields.

1                   15.     The scanning apparatus according to claim 10, wherein each  
2     measurement zone has at least one minimum and one maximum color density value.

1                   16.     The scanning apparatus according to claim 8, wherein at least one of said  
2     measurement fields comprises the reference object.

1                   17.     The scanning apparatus according to claim 7, wherein said measurement  
2     heads are arranged one after another along said coordinate direction, the measurement heads  
3     being moveable along said coordinate direction.

1                   18.     The scanning apparatus according to claim 17, wherein the apparatus is  
2     disposed above a printing machine roll, the printing medium being carried on said roll.

1                   19.     The scanning apparatus according to claim 17, further comprising a slide  
2 device, said measurement heads being carried on said slide device, said slide device being  
3 moveable translationally along said coordinate direction.

1                   20.     The scanning apparatus according to claim 18, further comprising a slide  
2 device, said measurement heads being carried on said slide device, said slide device being  
3 moveable translationally along said coordinate direction.

1                   21.     The scanning apparatus according to claim 19, wherein in progressive  
2 time with slide device translational movement, each measurement head scans a measurement  
3 section on said measurement strip associated with said each measurement head.

1                   22.     The scanning apparatus according to claim 6, wherein the printing  
2 medium is carried on a printing roll, said apparatus further comprising an angle measurement  
3 transmitter carried on said printing roll for detecting an angle of rotation of said printing roll,  
4 said transmitter being electrically operatively connected to the apparatus.

1                   23.     The scanning apparatus according to claim 22, further comprising a  
2 control electronics unit, said control electronics unit being operative to detect a current angle of  
3 rotation of said printing roll at detection of said reference object and trigger activation of

4 apparatus scanning when a predicted angle-of-rotation increment relative to that at detection is  
5 reached.

1                   24.     The scanning apparatus according to claim 22, further comprising a  
2 control electronics unit, said control electronics unit triggering activation of said scanning  
3 apparatus with a predicted time-delay signal, the time delay being functionally dependent on a  
4 predetermined distance between the reference object and the measurement object.

5